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March 9, 2009 ~~May 19, 2008~~ P.N. 5604-01

Ms. Mina Chuong
Amerco Real Estate Company
2727 North Central Avenue, Suite 500
Phoenix, AZ 85004

PROJECT: ***Top of The Pines Subdivision (TPM 20951 RPL. 1)***
RE: ***Environmental Noise Assessment***

Dear Ms. Chuong:

This report contains our assessment of the noise environment at the proposed Top of the Pines subdivision (TPM 20951) project located in the County of San Diego. In summary, the project would develop the site with four lots. The future noise level at the proposed building pad sites would range up to approximately 59 ~~60~~ dB CNEL at the first floor level of the lots. This noise level would comply with the County's 60 dB CNEL exterior noise criterion. Thus, mitigation measures are not required.

To comply with the County's interior noise standard, an interior noise analysis will be required for Lots ~~3 or~~ 4 if a two story home is ~~are~~ constructed on this lot ~~these lots~~. The home on Lot 4 ~~these lots~~ could require air conditioning or mechanical ventilation system and sound-rated windows to mitigate the interior noise impact. The interior noise study will be required prior to issuance of building permit.

1.0 BACKGROUND

1.1 Project Setting

The Top of the Pines Subdivision project site is located at the northwest corner of Interstate 8 (I-8) and Pine Valley Road within the community of Pine Valley *(Figures 1 and 2)*. The project would develop the site with four single family lots. The primary existing noise source at the site is vehicular traffic along I-8. The existing traffic volume is approximately 21,500 average daily traffic (ADT) along I-8 (Caltrans 2005). There is no existing ADT traffic volume published for Pine Valley Road. This analysis is based on the preliminary grading plan (Kappa Surveying, ~~April 2008~~).

1.2 County Noise Criteria

The County of San Diego typically describes community noise levels in terms of the Community Noise Equivalent Level (CNEL). CNEL is the average A-weighted sound level during a 24-hour day. It is obtained after adding five decibels (dB) to sound levels in the evening hours (7 p.m. to 10 p.m.) and adding ten dB to the sound levels at night (10 p.m. to 7 a.m.). The five and ten dB penalties are applied to account for increased noise sensitivity during the evening and nighttime hours. The A-weighted scale measures noise levels corresponding to the human hearing frequency response. All sound levels discussed in this report are A-weighted. The acoustical terminology used in this report is defined in *Attachment 1*.

The County has established exterior noise guidelines in the noise element of the County's adopted General Plan (County of San Diego 2006). These guidelines identify compatible exterior noise levels for various land use types. The maximum acceptable exterior noise level for new single family development is 60 dB CNEL. This criterion is applied at the outdoor noise sensitive area. In addition, the County requires that interior noise levels not exceed a CNEL of 45 dB.

Applicable to this project, Chapter 4 of Policy 4b of the County's Noise Element states that:

If the acoustical study shows that noise levels at any noise sensitive land use will exceed CNEL equal to 60 decibels, modifications shall be made to the development which reduce the exterior noise level to less than 60 dB CNEL and the interior noise level to less than 45 dB CNEL.

If modifications are not made to the development in accordance with the above paragraph, the development shall not be approved unless a finding is made that there are specifically identified overriding social or economic considerations which warrant approval of the development without such modification: provided, however, if the acoustical study shows the sound levels for any noise sensitive land use will exceed a 75 dB CNEL even with such modifications, the development shall not be approved irrespective of such social or economic considerations.

"Development" means any physical development including but not limited to residences, commercial, or industrial facilities, roads, civic buildings, hospitals, schools, airports, or similar facilities.

For single family detached dwelling projects, "exterior noise" means noise measured at an outdoor living area which adjoins and is on the same lot as the dwelling, and which contains at least the following minimum area:

(i)	Net lot area up to 4,000 square feet:	400 square feet
(ii)	Net lot area 4,000 square feet to 10 acres:	10% of net lot area
(iii)	Net lot area over 10 acres:	1 acre

"Noise sensitive land use" means any residence, hospital, school, hotel, resort, library or any other facility where quiet is an important attribute of the environment.

The County Department of Planning and Land Use also utilizes significance thresholds for evaluating off-site noise impacts to residences or noise sensitive areas from project-related traffic. The County considers such impacts to be significant when they exceed three dB CNEL and either elevate noise levels above 60 dB CNEL or exceed a three dB increase above an already noisy existing condition (i.e., 60 dB CNEL).

A noise impact is also considered significant if project implementation will produce additional noise which will cause any onsite or off-site, noise sensitive area to experience an increase in noise of 10 dB CNEL or more.

Construction noise is governed by the County's noise ordinance. Specifically, it shall be unlawful to operate any construction equipment so as to cause at or beyond the property line of any property upon which a legal dwelling unit is located an average sound level greater than 75 dB between the hours of 7:00 a.m. through 7:00 p.m., Monday through Saturday excluding legal holidays. The County interprets the average sound level to mean the one-hour average sound level.

2.0 EXISTING CONDITIONS

2.1 Ambient Noise Monitoring

Noise measurements were conducted at the site to determine the existing noise level. The measurements were made with a calibrated Larson-Davis Laboratories Model 700 (S.N. 2132) and Rion NL 32 integrating sound level meters equipped with ½-inch pre-polarized condenser microphones with pre-amplifiers. When equipped with these microphones, the sound level meters meet the current American National Standards Institute standard for a Type 1 precision sound level meter. The sound level meters were positioned at a height of approximately five-feet above the ground.

The noise measurements were conducted on November 21, 2005. The noise measurement locations are depicted as Sites 1-4 on *Figure 3*. The sites were selected to maximize the

exposure to I-8. However, all the sites have obstructed views to I-8. There is intervening topography along the southern property boundary that shields the highway lanes across from the site. Also, there is topography within the median that shields the eastbound lanes across from the site. East of the site the highway is visible at Sites 1, 3 and 4. West of the site, only a short segment of the highway is visible at Site 4. The measured average noise levels were 51 to 53 dB at Sites 1, 3 and 4 which have the greatest noise exposure to I-8. Site 1 is also exposed to traffic noise from Pine Valley Road. Noise from this I-8 and Pine Valley Road contributed about equally to the average sound level during the noise measurement at Site 1. The measured average noise level was 42 dB at Site 2. This site is located behind a slope and does not have a view to I-8. The measured average noise levels and the concurrent traffic volumes are depicted in *Table 1*.

2.2 Noise Modeling

The existing CNEL was calculated for Sites 1-4 based on the current traffic volume along I-8 and Pine Valley Road using the Federal Highway Administration's TPM 2.5 Traffic Noise Model (FHWA 2004). The same traffic volume and vehicle composition ratios counted during the noise measurement were used to calibrate the model and verify the input used in the noise model. The modeled existing traffic speed was 65 mph along Highway I-8 and 40 mph along Pine Valley Road. The modeled value was two to three dB greater than the measured noise level at all sites. The difference is most likely results from the accuracy limitations of the model associated with the complexity of the intervening terrain. Therefore, the noise modeling results are considered worst-case. Other input includes the intervening terrain, hard soil type in close proximity to the roads, and field grass for the majority of the area. These two ground conditions are representative of the closest types of sound propagation components available in the noise model.

To determine the CNEL, the existing daily truck mix used in the noise model for I-8 was 4.4% medium trucks and 9.2% heavy trucks. The truck percentage is based on truck mix counts conducted by Caltrans (Caltrans 2008 ~~2006~~). Pine Valley Road was modeled assuming approximately 6.7 percent medium trucks and 2.7 percent heavy trucks. The modeled existing CNEL is 55 dB at Site 1, 48 dB CNEL at Site 2, 58 dB at Site 3 and 58 dB at Site 4. The noise modeling data is included in *Attachment 2*. For the purposes of the existing noise modeling we estimated an ADT of 3,000 along Pine Valley Road. However, there is no published traffic information available for this road.

TABLE 1
Measured Noise Level and Traffic Volumes on I-8

Site	Description	Date Time	L_{eq}[1]	L_{eq}[2]	Cars	MT[3]	HT[4]
1	Parcel 1 approximately 1,050 ft. to centerline of I-8	11/21/05 1:15 to 1:45 p.m.	51 dB	53 dB	397	14	65
2	Parcel 2 approximately 550 ft. to centerline of I-8	11/21/05 1:15 to 1:45 p.m.	42 dB	45 dB	397	14	65
3	Parcel 3 approximately 600 ft. to centerline of I-8	11/21/05 12:15 to 12:45 p.m.	53 dB	55 dB	386	13	70
4	Parcel 4 approximately 750 ft. to centerline of I-8	11/21/05 12:15 to 12:45 p.m.	52 dB	55 dB	386	13	70

Notes: [1] Equivalent Continuous Sound Level (measured Leq)
[2] Modeled Leq
[3] Medium Trucks
[4] Heavy Trucks
Temperature 79 degrees, 20 percent relative humidity. Wind < 5 mph and westerly.
Traffic Volume on Pine Valley Road, 69 cars, 5 medium trucks, 2 heavy trucks (1:15 to 1:45 p.m.)

3.0 FUTURE CONDITIONS

In the future, the project site will continue to be exposed to traffic noise from I-8 and to a lesser extent, Pine Valley Road. The future year 2030 traffic volume would be approximately 28,000 ~~34,000~~ ADT along I-8 and 7,000 ~~8,000~~ ADT along Pine Valley Road (SANDAG 2008 ~~2006~~).

3.1 Exterior Traffic Noise Impact

Based on the future traffic volumes, the noise level at the graded pads of the lots would range from approximately 58 to 59 ~~51 to 60~~ dB CNEL. These noise levels would comply with the County's exterior noise criterion. The future first floor noise levels at the lots are depicted in *Figure 4*. These calculations take into account the noise attenuation associated with the intervening topography between the lots and both I-8 and Pine Valley Road.

The noise level at the second floor would range up to approximately 60 dB CNEL at Lot 1, 60 ~~59~~ dB CNEL at Lot 2, 59 ~~62~~ dB CNEL at Lot 3 and 63 dB CNEL at Lot 4. These calculations take into account the noise attenuation associated with the intervening topography between the lots and both I-8 and Pine Valley Road.

3.2 Interior Noise Impact

The County requires that interior noise levels not exceed a CNEL of 45 dB. Typically, with the windows open, building shells provide approximately 15 dB of noise reduction. Therefore, rooms exposed to an exterior CNEL greater than 60 dB could result in an interior CNEL greater than 45 dB. Lots ~~3 and~~ 4 could exceed an interior noise level greater than 45 dB CNEL.

4.0 MITIGATION

4.1 Exterior Traffic Noise Mitigation

The proposed project would comply with the County's General Plan Noise Element exterior noise criterion, therefore, noise mitigation measures are not proposed.

4.2 Interior Traffic Noise Mitigation

To comply with the County's interior noise standard, an interior noise analysis will be required for Lots ~~3 or~~ 4 if a two story house is ~~are~~ constructed on this lot ~~these lots~~. The interior acoustical analysis will be required prior to the issuance of building permits to ensure that the interior CNEL would not exceed 60 dB. The home on this lot ~~these lots~~ could require air-conditioning or mechanical ventilation, and sound-rated windows.

- - - -

This concludes our noise assessment. If you have any questions, please call me.

Very truly yours,

Mike Komula
Acoustician

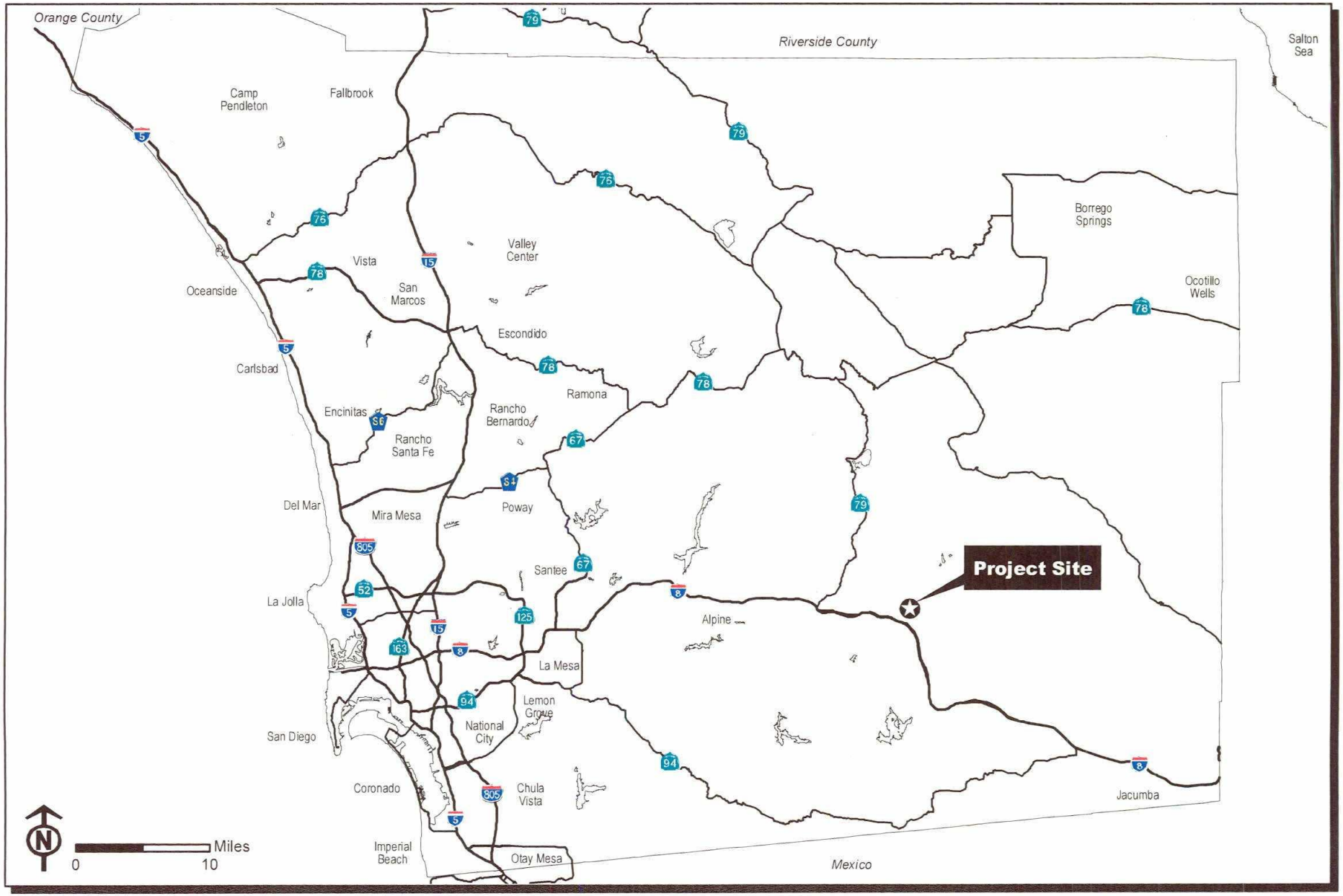
REFERENCES

California Department of Transportation (Caltrans), 2008. *2007 Annual Average Daily Traffic Volume on the California State Highway System.*

Federal Highway Administration, April 2004. *FHWA Traffic Noise Model User's Guide (Version 2.5 Addendum).*

County of San Diego, September 27, 2006. *San Diego County General Plan Noise Element.*

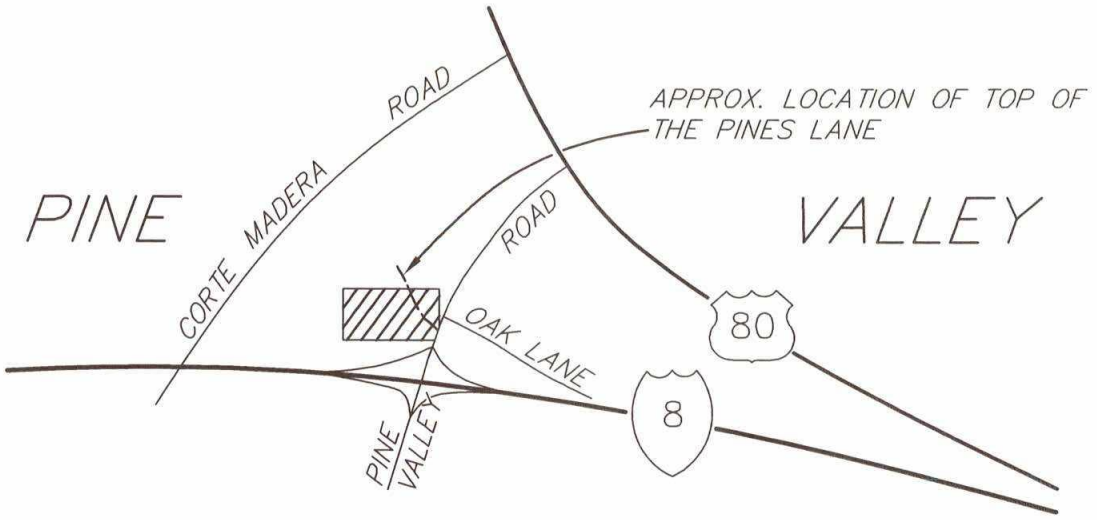
San Diego Association of Governments (SANDAG), February 2008 ~~January 2006~~ *Transportation Forecast Information Center 2030 Traffic Volume Forecast.*



Top of the Pines Subdivision (TMP 20951) - Environmental Noise Assessment

Regional Location

FIGURE 1



THOMAS. BROS. 1237B7

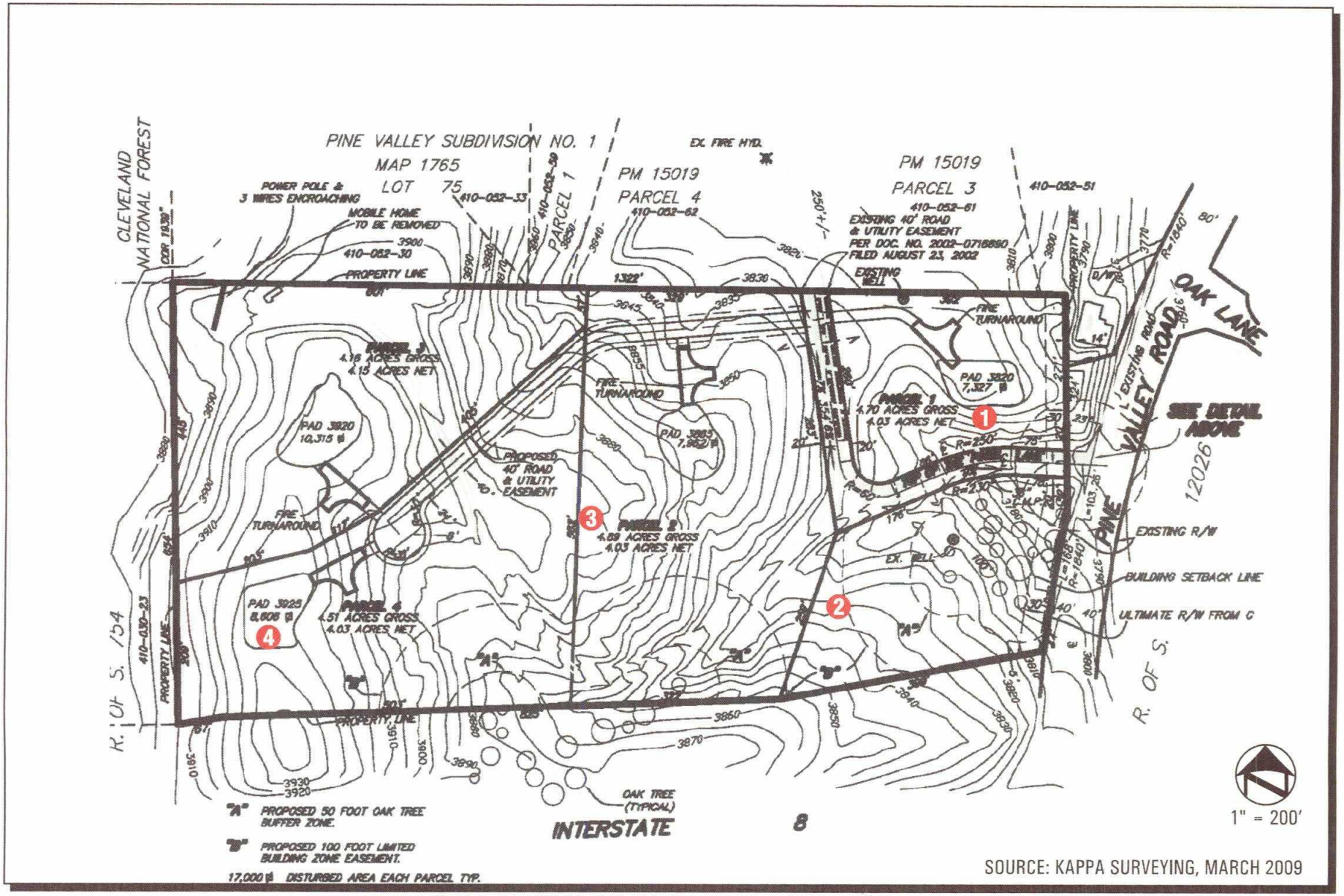
SOURCE: KAPPA SURVEYING, INC.

NOT TO SCALE

Top of the Pines Subdivision (TMP 20951) - Environmental Noise Assessment

Project Vicinity

FIGURE 2

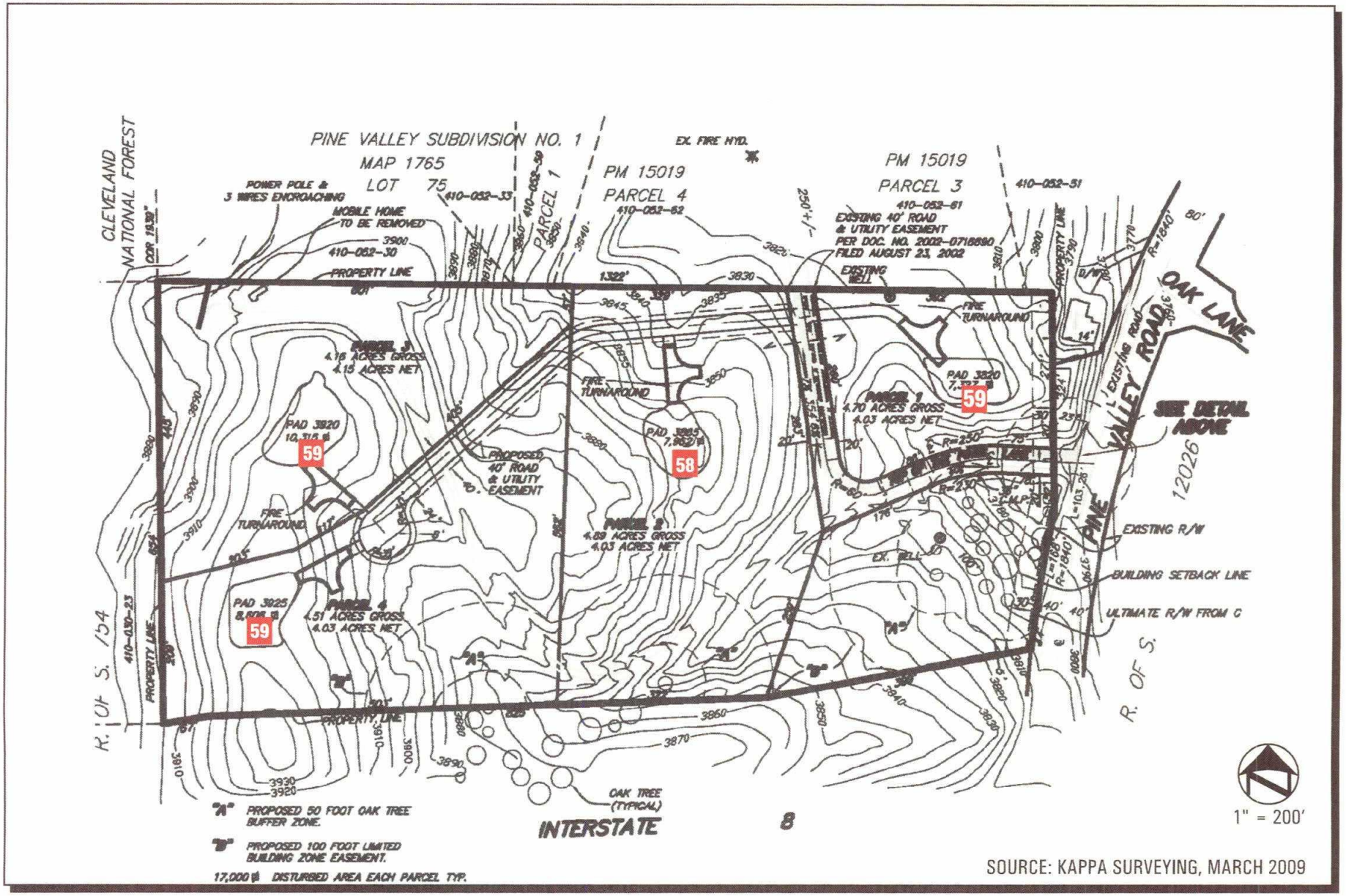


SOURCE: KAPPA SURVEYING, MARCH 2009

Top of the Pines Subdivision (TMP 20951) - Environmental Noise Assessment

Noise Measurement Locations

FIGURE 3



SOURCE: KAPPA SURVEYING, MARCH 2009

Top of the Pines Subdivision (TMP 20951) - Environmental Noise Assessment

Future CNEL

FIGURE 4

ATTACHMENT 1

Definitions

ATTACHMENT 1
DEFINITIONS

Term	Definition
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
A-Weighted Sound Level	The sound pressure level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Community Noise Equivalent Level, CNEL	CNEL is the A-weighted equivalent continuous sound exposure level for a 24-hour period with a ten dB adjustment added to sound levels occurring during nighttime hours (10 pm to 7 am) and a five dB adjustment added to the sound levels occurring during the evening hours (7pm to 10 pm).
Decibel, dB	A unit for measuring sound pressure level and is equal to 10 times the logarithm to the base 10 of the ratio of the measured sound pressure squared to a reference pressure, which is 20 micropascals.
Equivalent Continuous Sound Level (L_{eq})	The sound level corresponding to a steady state sound level containing the same total energy as a varying signal over a given sample period. L_{eq} is designed to average all of the loud and quiet sound levels occurring over a time period.
Maximum A-weighted Sound Level, (L_{max})	The greatest sound level measured on a sound level (L_{max}) meter during a designated time interval or event using fast time-averaging and A-weighting.
Sound Transmission Class, STC	A single number rating of the noise reduction of a building element.

ATTACHMENT 2

TNM 2.5 Noise Modeling Data

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9 March 2009
TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: Top of the Pines
RUN: Future

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway		Points					Flow Control			Segment	
Name	Width	Name	No.	Coordinates (pavement) X	Y	Z	Control Device	Speed Constraint	Percent Vehicles Affected	Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
I-8 (Eastbound)	48.0	point1	1	12,308.0	933.0	3,820.00				Average	
		point2	2	12,731.0	968.0	3,816.00				Average	
		point3	3	13,162.0	972.0	3,908.00				Average	
		point4	4	13,568.0	949.0	3,900.00				Average	
		point5	5	14,067.0	881.0	3,890.00				Average	
		point6	6	14,233.0	849.0	3,888.00				Average	
		point7	7	14,623.0	754.0	3,888.00				Average	
		point8	8	14,795.0	703.0	3,890.00				Average	
		point9	9	15,210.0	557.0	3,900.00				Average	
		point10	10	15,854.0	241.0	3,920.00					
I-8 (Westbound)	48.0	point20	20	15,950.0	524.0	3,860.00				Average	
		point19	19	15,498.0	740.0	3,850.00				Average	
		point18	18	15,179.0	867.0	3,852.00				Average	
		point17	17	14,850.0	978.0	3,850.00				Average	
		point16	16	14,511.0	1,070.0	3,856.00				Average	
		point15	15	14,317.0	1,114.0	3,860.00				Average	
		point14	14	13,865.0	1,194.0	3,870.00				Average	
		point13	13	13,387.0	1,239.0	3,880.00				Average	
		point12	12	12,919.0	1,248.0	3,890.00				Average	
		point11	11	12,397.0	1,218.0	3,900.00					
Pine Valley Road (Northbound)	12.0	point21	21	14,388.0	1,129.0	3,834.00				Average	
		point22	22	14,417.0	1,353.0	3,820.00				Average	
		point23	23	14,438.0	1,519.0	3,810.00				Average	
		point24	24	14,457.0	1,662.0	3,800.00				Average	
		point25	25	14,476.0	1,789.0	3,790.00				Average	

		point26	26	14,510.0	1,933.0	3,780.00				Average	
		point27	27	14,548.0	2,046.0	3,770.00				Average	
		point28	28	14,598.0	2,164.0	3,760.00				Average	
		point29	29	14,667.0	2,315.0	3,750.00				Average	
		point30	30	14,796.0	2,515.0	3,740.00					
Pine Valley Road (Southbound)	12.0	point40	40	14,776.0	2,528.0	3,740.00				Average	
		point39	39	14,655.0	2,342.0	3,750.00				Average	
		point38	38	14,582.0	2,187.0	3,760.00				Average	
		point37	37	14,530.0	2,064.0	3,770.00				Average	
		point36	36	14,490.0	1,949.0	3,780.00				Average	
		point35	35	14,459.0	1,813.0	3,790.00				Average	
		point34	34	14,435.0	1,674.0	3,800.00				Average	
		point33	33	14,414.0	1,518.0	3,810.00				Average	
		point32	32	14,393.0	1,356.0	3,820.00				Average	
		point31	31	14,365.0	1,132.0	3,834.00					

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9 March 2009
TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: Top of the Pines
RUN: Future

Roadway	Points		Segment									
Name	Name	No.	Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
I-8 (Eastbound)	point1	1	1211	65	62	65	129	65	0	0	0	0
	point2	2	1211	65	62	65	129	65	0	0	0	0
	point3	3	1211	65	62	65	129	65	0	0	0	0
	point4	4	1211	65	62	65	129	65	0	0	0	0
	point5	5	1211	65	62	65	129	65	0	0	0	0
	point6	6	1211	65	62	65	129	65	0	0	0	0
	point7	7	1211	65	62	65	129	65	0	0	0	0
	point8	8	1211	65	62	65	129	65	0	0	0	0
	point9	9	1211	65	62	65	129	65	0	0	0	0
	point10	10										
I-8 (Westbound)	point20	20	1210	65	62	65	129	65	0	0	0	0
	point19	19	1210	65	62	65	129	65	0	0	0	0
	point18	18	1210	65	62	65	129	65	0	0	0	0
	point17	17	1210	65	62	65	129	65	0	0	0	0
	point16	16	1210	65	62	65	129	65	0	0	0	0
	point15	15	1210	65	62	65	129	65	0	0	0	0
	point14	14	1210	65	62	65	129	65	0	0	0	0
	point13	13	1210	65	62	65	129	65	0	0	0	0
	point12	12	1210	65	62	65	129	65	0	0	0	0
	point11	11										
Pine Valley Road (Northbound)	point21	21	317	40	23	40	10	40	0	0	0	0
	point22	22	317	40	23	40	10	40	0	0	0	0
	point23	23	317	40	23	40	10	40	0	0	0	0

	point24	24	317	40	23	40	10	40	0	0	0	0
	point25	25	317	40	23	40	10	40	0	0	0	0
	point26	26	317	40	23	40	10	40	0	0	0	0
	point27	27	317	40	23	40	10	40	0	0	0	0
	point28	28	317	40	23	40	10	40	0	0	0	0
	point29	29	317	40	23	40	10	40	0	0	0	0
	point30	30										
Pine Valley Road (Southbound)	point40	40	317	40	23	40	10	40	0	0	0	0
	point39	39	317	40	23	40	10	40	0	0	0	0
	point38	38	317	40	23	40	10	40	0	0	0	0
	point37	37	317	40	23	40	10	40	0	0	0	0
	point36	36	317	40	23	40	10	40	0	0	0	0
	point35	35	317	40	23	40	10	40	0	0	0	0
	point34	34	317	40	23	40	10	40	0	0	0	0
	point33	33	317	40	23	40	10	40	0	0	0	0
	point32	32	317	40	23	40	10	40	0	0	0	0
	point31	31										

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9 March 2009
TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: Top of the Pines
RUN: Future

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria Existing LAeq1h	Impact Criteria LAeq1h	Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
Site 1	1	1	14,308.0	2,037.0	3,820.00	5.00	0.00	66	10.0	8.0	Y
Site 2	2	1	13,976.0	1,626.0	3,830.00	5.00	0.00	66	10.0	8.0	Y
Site 3	3	1	13,721.0	1,831.0	3,885.00	5.00	0.00	66	10.0	8.0	Y
Site 4	4	1	13,247.0	1,677.0	3,925.00	5.00	0.00	66	10.0	8.0	Y
Site 4 2nd	9	1	13,247.0	1,677.0	3,925.00	15.00	0.00	66	10.0	8.0	Y
Lot 1	10	1	14,343.0	2,053.0	3,820.00	5.00	0.00	66	10.0	8.0	Y
Lot 1	11	1	14,356.0	2,013.0	3,820.00	5.00	0.00	66	10.0	8.0	Y
Lot 1	12	1	14,305.0	2,007.0	3,820.00	5.00	0.00	66	10.0	8.0	Y
Lot 2	13	1	13,912.0	1,923.0	3,865.00	5.00	0.00	66	10.0	8.0	Y
Lot 2	14	1	13,903.0	1,904.0	3,865.00	5.00	0.00	66	10.0	8.0	Y
Lot 2	15	1	13,880.0	1,895.0	3,865.00	5.00	0.00	66	10.0	8.0	Y
Lot 2	16	1	13,848.0	1,918.0	3,865.00	5.00	0.00	66	10.0	8.0	Y
Lot 4	17	1	13,279.0	1,647.0	3,925.00	5.00	0.00	66	10.0	8.0	Y
Lot 3	21	1	13,350.0	1,933.0	3,920.00	5.00	0.00	66	10.0	8.0	Y
Lot 3	22	1	13,297.0	1,915.0	3,920.00	5.00	0.00	66	10.0	8.0	Y
Lot 3	23	1	13,290.0	1,956.0	3,920.00	5.00	0.00	66	10.0	8.0	Y
Lot 1 2nd	27	1	14,343.0	2,053.0	3,820.00	15.00	0.00	66	10.0	8.0	Y
Lot 1 2nd	28	1	14,356.0	2,013.0	3,820.00	15.00	0.00	66	10.0	8.0	Y
Lot 1 2nd	29	1	14,305.0	2,007.0	3,820.00	15.00	0.00	66	10.0	8.0	Y
Lot 2 2nd	30	1	13,912.0	1,923.0	3,865.00	15.00	0.00	66	10.0	8.0	Y
Lot 2 2nd	31	1	13,903.0	1,904.0	3,865.00	15.00	0.00	66	10.0	8.0	Y
Lot 2 2nd	32	1	13,880.0	1,895.0	3,865.00	15.00	0.00	66	10.0	8.0	Y

INPUT: RECEIVERS **Top of the Pines**

Lot 2 2nd	33	1	13,848.0	1,918.0	3,865.00	15.00	0.00	66	10.0	8.0	Y
Lot 4 2nd	34	1	13,279.0	1,647.0	3,925.00	15.00	0.00	66	10.0	8.0	Y
Lot 3 2nd	35	1	13,350.0	1,933.0	3,920.00	15.00	0.00	66	10.0	8.0	Y
Lot 3 2nd	36	1	13,297.0	1,915.0	3,920.00	15.00	0.00	66	10.0	8.0	Y
Lot 3 2nd	37	1	13,290.0	1,956.0	3,920.00	15.00	0.00	66	10.0	8.0	Y

INPUT: TERRAIN LINES

Dudek **9 March 2009**
MJK--March 2009 **TNM 2.5**

INPUT: TERRAIN LINES
PROJECT/CONTRACT: **Top of the Pines**
RUN: **Future**

Terrain Line Name	Points No.	Coordinates (ground) X ft	Y ft	Z ft
Topo in I-8 Median	1	12,330.0	987.0	3,920.00
	2	12,444.0	1,013.0	3,930.00
	3	12,485.0	1,021.0	3,936.00
	4	12,633.0	1,034.0	3,936.00
	5	12,687.0	1,035.0	3,930.00
	6	12,742.0	1,030.0	3,920.00
	7	12,762.0	1,034.0	3,920.00
	8	12,807.0	1,049.0	3,924.00
	9	13,007.0	1,051.0	3,924.00
	10	13,093.0	1,051.0	3,930.00
	11	13,222.0	1,046.0	3,930.00
	12	13,410.0	1,034.0	3,920.00
	13	13,653.0	1,005.0	3,910.00
	14	13,731.0	989.0	3,900.00
	15	14,089.0	917.0	3,890.00
Topo Adjacent I-8	16	13,110.0	1,408.0	3,900.00
	17	13,149.0	1,430.0	3,910.00
	18	13,187.0	1,451.0	3,920.00
	19	13,237.0	1,480.0	3,930.00
	20	13,270.0	1,499.0	3,936.00
	21	13,294.0	1,507.0	3,936.00
	22	13,332.0	1,513.0	3,930.00
	23	13,380.0	1,500.0	3,920.00
	24	13,434.0	1,480.0	3,910.00

	25	13,478.0	1,466.0	3,900.00
	26	13,563.0	1,453.0	3,890.00
	27	13,639.0	1,435.0	3,880.00
	28	13,774.0	1,449.0	3,876.00
	29	13,940.0	1,488.0	3,876.00
	30	13,978.0	1,484.0	3,870.00
	31	14,036.0	1,487.0	3,860.00
	32	14,123.0	1,490.0	3,852.00
	33	14,162.0	1,501.0	3,852.00
	34	14,181.0	1,495.0	3,850.00
	35	14,288.0	1,500.0	3,840.00
	36	14,351.0	1,512.0	3,830.00
	37	14,376.0	1,526.0	3,820.00
Topo Adjacent PVR	38	14,418.0	1,967.0	3,800.00
	39	14,466.0	1,975.0	3,800.00
	40	14,471.0	2,070.0	3,800.00
	41	14,418.0	2,082.0	3,800.00
	42	14,432.0	2,131.0	3,800.00
	43	14,427.0	2,161.0	3,800.00
	44	14,436.0	2,317.0	3,800.00
Topo Lot 4	49	13,238.0	1,481.0	3,930.00
	45	13,221.0	1,633.0	3,928.00
	46	13,198.0	1,661.0	3,925.00
	47	13,228.0	1,768.0	3,925.00
	48	13,278.0	1,859.0	3,925.00
Topo lot4	50	13,317.0	1,726.0	3,925.00
	51	13,287.0	1,637.0	3,925.00
	52	13,229.0	1,634.0	3,925.00
	53	13,215.0	1,648.0	3,925.00
	54	13,214.0	1,717.0	3,925.00
topo Lot3	55	13,387.0	1,962.0	1,320.00
	56	13,357.0	1,924.0	1,320.00
	57	13,313.0	1,903.0	1,320.00
	58	13,277.0	1,907.0	1,320.00
	59	13,261.0	1,929.0	1,320.00
	60	13,301.0	1,991.0	1,320.00

Dudek

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TNM 2.5

INPUT: GROUND ZONES

PROJECT/CONTRACT: Top of the Pines

RUN: Future

Ground Zone			Points		
Name	Type	Flow Resistivity	No.	Coordinates X	Y
		cgs rayls		ft	ft
Ground Zone6	Field	150	34	14,308.7	1,174.9
			35	14,386.6	1,576.2
			36	14,440.5	1,917.6
			37	14,506.4	2,145.2
			38	14,572.2	2,384.8
			39	14,572.2	2,528.5
			40	13,092.8	1,833.7
			41	13,092.8	1,516.3
			42	13,092.8	1,312.6
			43	14,272.8	1,180.8

Dudek
MJK--March 2009

9 March 2009
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Top of the Pines
RUN: Future
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Site 1	1	1	0.0	57.5	66	57.5	10	----	57.5	0.0	8	-8.0
Site 2	2	1	0.0	49.8	66	49.8	10	----	49.8	0.0	8	-8.0
Site 3	3	1	0.0	59.0	66	59.0	10	----	59.0	0.0	8	-8.0
Site 4	4	1	0.0	59.3	66	59.3	10	----	59.3	0.0	8	-8.0
Site 4 2nd	9	1	0.0	62.1	66	62.1	10	----	62.1	0.0	8	-8.0
Lot 1	10	1	0.0	58.4	66	58.4	10	----	58.4	0.0	8	-8.0
Lot 1	11	1	0.0	59.2	66	59.2	10	----	59.2	0.0	8	-8.0
Lot 1	12	1	0.0	58.1	66	58.1	10	----	58.1	0.0	8	-8.0
Lot 2	13	1	0.0	58.0	66	58.0	10	----	58.0	0.0	8	-8.0
Lot 2	14	1	0.0	58.0	66	58.0	10	----	58.0	0.0	8	-8.0
Lot 2	15	1	0.0	57.9	66	57.9	10	----	57.9	0.0	8	-8.0
Lot 2	16	1	0.0	57.5	66	57.5	10	----	57.5	0.0	8	-8.0
Lot 4	17	1	0.0	59.0	66	59.0	10	----	59.0	0.0	8	-8.0
Lot 3	21	1	0.0	58.0	66	58.0	10	----	58.0	0.0	8	-8.0
Lot 3	22	1	0.0	58.7	66	58.7	10	----	58.7	0.0	8	-8.0
Lot 3	23	1	0.0	58.7	66	58.7	10	----	58.7	0.0	8	-8.0
Lot 1 2nd	27	1	0.0	59.5	66	59.5	10	----	59.5	0.0	8	-8.0
Lot 1 2nd	28	1	0.0	60.4	66	60.4	10	----	60.4	0.0	8	-8.0
Lot 1 2nd	29	1	0.0	59.4	66	59.4	10	----	59.4	0.0	8	-8.0
Lot 2 2nd	30	1	0.0	59.9	66	59.9	10	----	59.9	0.0	8	-8.0
Lot 2 2nd	31	1	0.0	60.0	66	60.0	10	----	60.0	0.0	8	-8.0
Lot 2 2nd	32	1	0.0	60.0	66	60.0	10	----	60.0	0.0	8	-8.0
Lot 2 2nd	33	1	0.0	59.5	66	59.5	10	----	59.5	0.0	8	-8.0
Lot 4 2nd	34	1	0.0	62.5	66	62.5	10	----	62.5	0.0	8	-8.0

Lot 3 2nd	35	1	0.0	58.4	66	58.4	10	----	58.4	0.0	8	-8.0
Lot 3 2nd	36	1	0.0	59.0	66	59.0	10	----	59.0	0.0	8	-8.0
Lot 3 2nd	37	1	0.0	58.9	66	58.9	10	----	58.9	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	27	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0